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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or relating to Stacking Apparatus

We, R. W. BARRACLOUGH LIMITED and RONALD WILLIAM BARRACLOUGH, both of Hartwood Road, Southport, Lancashire, respectively a British Company and a British Subject, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to stacking apparatus and is more particularly concerned with apparatus used during the manufacture of bags of plastics material.

In one particular method of manufacturing bags of plastics material, a continuous tubular length of material is formed and folded at opposite sides so that it is flat. It is then fed to a guillotine where suitable and equal lengths are severed. After the guillotining operation, the severed lengths are formed into a bag by sealing the edges at one open end. Usually, however, the guillotining operation and the bag-forming operation are effected by separated machines and the severed lengths of material have to be conveyed from the guillotining machine to the bag-forming machine.

To enable the conveying operation to be undertaken efficiently, it is desirable that the severed lengths should be stacked as they issue from the guillotine and it is the main object of the present invention to provide apparatus by which this may be simply and efficiently effected.

According to the invention, a length of material is fed to and hangs down from support means and gripping members are arranged to grip the length of material transversely on both sides thereof adjacent to the support means and to be moved to traverse the length of material away from the support means over a stacking surface, the gripping members being separated when the length of material is in a predetermined position on the stacking surface and braking means become effective simultaneously with the separation of the gripping

[Price 4s. 6d.]

members to engage with and prevent further movement of the length of material during subsequent movement of the separated gripping members.

The invention will be better understood from the following description of one embodiment taken in conjunction with the accompanying drawings comprising Figs. 1 to 3. In the drawings, Fig. 1 shows a side elevation of the apparatus, Fig. 2 shows a plan view, while Fig. 3 shows various stages in the stacking operation.

Briefly, the apparatus operates in the following manner. A web of flattened tubular material is fed by a pair of horizontally arranged rollers between the blades of a guillotine and thence over a guide plate, the leading edge of the web hanging freely as it leaves the guide plate. When the appropriate length of web has been fed through the guillotine, the web is gripped remote from the leading edge along a transverse line by two gripper bars. Simultaneously with the gripping operation, the guillotine is effective to sever the web transversely so that the web is held only by the gripper bars.

The gripper bars are continuously traversed over separate closed paths, the path of one of the gripper bars extending between the freely hanging web and the guillotine so as to engage the web on the underside along a line below the lower lip of the guide plate. The path of the other gripper bar approaches the web from above and forward of the web. The two paths coincide over a horizontal portion and when the bars meet to enter the horizontal portion of the traverse, the web is gripped therebetween and the guillotine is operated.

The speed of traverse of the two bars is the same and during the horizontal portion of the traverse, the bars move over a stacking surface which, in the particular embodiment, is in the form of a horizontal table. It will be understood, therefore that during the horizontal portion of the traverse, the severed

length of web will be drawn over the horizontal table with the trailing edge of the severed length of web i.e. the edge cut by the guillotine, extending between the bars and back-
 5 wardly above the main portion of the severed length.

The extent of the horizontal traverse of the bars is such as to draw the leading edge of the severed length of web on to the horizontal
 10 table whereupon the path of the lowermost bar continues the horizontal traverse while the path of the uppermost bar diverges upwardly therefrom. As the two bars separate, a braking device becomes operative to hold the severed
 15 length against the table or against the previously laid length so that the continued movement of the lowermost bar draws the trailing edge, as previously defined, forward so that the severed length lies entirely flat on the table
 20 or on the previously laid length.

Referring now to the drawings, the apparatus comprises a framework consisting of four uprights of which two only, 10 and 11 are
 25 shown in Fig. 1. Braking struts such as 12 are provided between the uprights and side plates 13 and 14 are secured to the upper ends of the uprights. The framework is joined by the member 15 to a second framework which carries the guillotine and the feeding
 30 rollers which feed the web from a roll to the guillotine. This latter apparatus is not shown in detail since it forms no part of the present invention. However, the framework carrying this apparatus is partially shown and consists of upright members of which one only,
 35 16, is shown in Fig. 1 and a vertical member 17 which carries support means 18 for a pair of feed rollers 19 and 20 and the stationary blade 21 and the moving blade 22 of the guillotine. This support member also includes
 40 the guide plate 23 over which the web is fed.

The drive for the apparatus is taken from a prime mover (not shown) to the shaft 24
 45 (Fig. 2) on which is mounted the chain wheels 25, 26. A continuous chain passes over the wheel 25 and chain wheels 27 and 28 and a second chain passes over wheels 26, 29 and 30. The lower gripper bars 31 are supported
 50 between these two chains. Chain wheels 27 and 29 are mounted on spindle 32 (Fig. 2) between the two side walls 13 and 14 and this spindle carries a further chain wheel 33 which drives chain wheel 34 mounted on
 55 spindle 35. Spindle 35 also carries a gear wheel 36 meshing with gear wheel 37 mounted on spindle 38. This spindle also carries chain wheels 39 and 40 and continuous chains 41 and 42 carrying the upper gripper bars 43
 60 passes over chain wheels 39, 40 and 44, 45, the latter being mounted on spindle 46. The upper gripper bars are covered, on the face engaging with the lower gripper bars, with a strip of foamed plastics material 47, to en-

sure a satisfactory grip on the length of material. 65

Also secured to the upper portion of the uprights 10 and 11 is an auxiliary framework 48 which provides runners 49 and 50 for a
 70 table or tray 51 which forms the horizontal surface on to which the lengths of material are to be stacked. As shown in Fig. 2 this tray has a width approximately twice the distance between the two side walls 13 and 14 and is provided with a handle 52 which
 75 enables it to be moved transversely relative to the side walls.

Two brake members 53 and 54 are provided and are pivoted on spindle 55 located between the two side walls 13 and 14. For operating the brake members, link member 56 is secured
 80 to the spindle 55 and an operating rod 57 has one end connected to the link member 56 and the other end connected to a cam follower 58 pivotally mounted at 59 to a bracket 60. The cam follower is operated by a cam (not shown) mounted on a shaft 24. Each
 85 of the brake members carries one or more (3 as shown) downwardly extending loops 61 of canvas or similar woven material and when the brake members are rotated in a counter-clockwise direction, the canvas loops engage
 90 with the length of material and hold it against further movement along the table.

Secured to the outer surface of the side wall 13 are two brackets 62 and 63 which
 95 serve as mountings for a rod 64. This rod carries a slide block 65 to which is attached the transversely extending rod 66 (Fig. 2). The purpose of this rod will be explained
 100 later.

It will be understood that the spacing of the gripper bars on both two chains must be the same for each chain. It will also be understood that the initial setting of the two chains
 105 relative to one another must be such that when the chains enter a horizontal portion of their traverse there should be engagement between an upper and a lower gripper bar.

The apparatus operates in the following
 110 manner. The length of material is fed between the rollers 19 and 20 and the cutting blades 21 and 22 of the guillotine and over the guide plate 23, the free end 67 of the length of material passing in the space between the spin-
 115 dles 46 and 68 as shown in Fig. 3a. When the correct length of material has been extended it is gripped between the gripper bars 31 and 43 as they enter the horizontal portion of their traverse and simultaneously the guillo-
 120 tine is operated to sever the material. This position is shown in Fig. 3b. The gripper bars now make their horizontal traverse and carry the length of material with them in the manner shown in Fig. 3c, the free end 67 of the
 125 length of material passing over the rod 66 so that the length of material is floated over the tray 51 rather than pulled over the surface

of the tray. At the moment of separation of the upper and lower gripper bars as shown in fig. 3d. The brake members 53 and 54 are rotated in a counter clockwise direction and the canvas loops 61 are therefore lowered into engagement with the length of material. Since the end of the length of material which was held by the gripper bars is now free, the gripper bar 31 during its continued horizontal traverse turns over this end of the length of material so that it falls on to the horizontal tray. This process is repeated for successive lengths of material so that these are piled one on top of the other on the tray.

When a sufficiently large number of lengths have been so deposited on the tray, the tray can be moved transversely and the pile removed without the necessity of stopping the machine.

It will of course, be understood that the invention is not limited to the precise arrangements shown but modifications may be made within the scope of the appendant claims such as, for example, a change in the number of brake members and a variation in the number of canvas loops used. Again the rod provided for floating the length of material on to the tray could be replaced by a fixed projection secured between the side walls 13 and 14. Other modifications will also occur to those skilled in the art.

WHAT WE CLAIM IS:—

1. Apparatus for stacking lengths of tubular plastics material, wherein a length of material is fed to and hangs down from support means and gripping members are arranged to grip the length of material transversely on both sides thereof adjacent to the support means and to be moved to traverse the length of material away from the support means over a stacking surface, the gripping members being separated when the length of material is in a predetermined position on the stacking surface and braking means become effective simultaneously with the separation of the gripping members to engage with and prevent further movement of the length of material during subsequent movement of the separated gripping members.

2. Apparatus as claimed in claim 1, wherein the gripping members are continuously moveable over separate closed paths which are contiguous in a portion parallel to said stacking surface.

3. Apparatus as claimed in claim 1 or 2, wherein a plurality of gripping members are mounted between two pairs of continuously driven chains.

4. Apparatus as claimed in any of claims 1, 2 or 3, wherein a rod is adjustably positioned transverse to the direction of movement of the length of material and above the level of the horizontal surface to enable the length of material to be floated over the horizontal surface.

5. Apparatus as claimed in any of claims 1, 2, 3 or 4 wherein the material is fed in a continuous length between cutting blades, the blades being operated to sever the required length of material simultaneously with the engagement of the length of material by the gripping members.

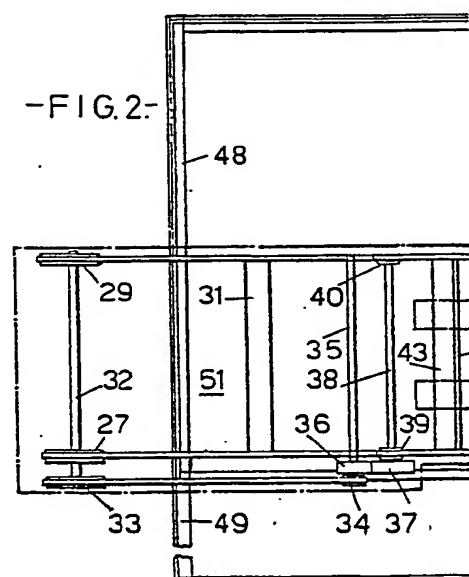
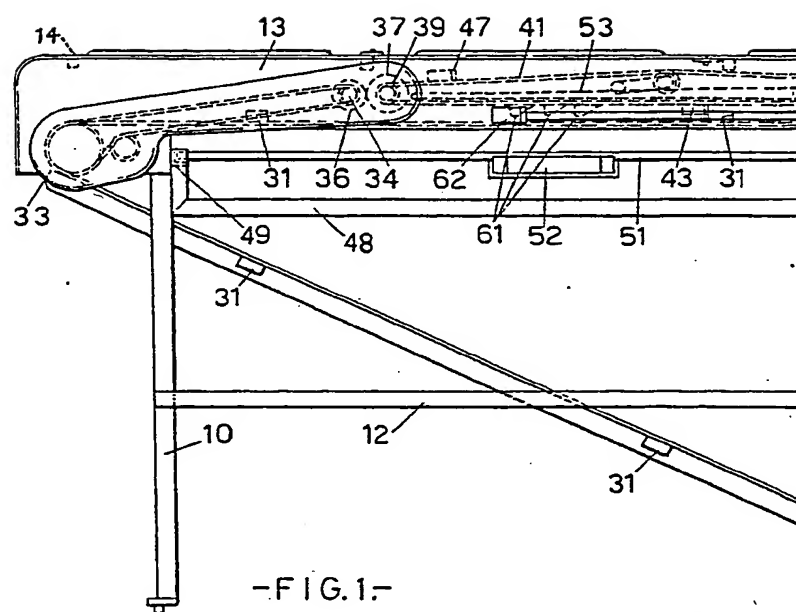
6. Apparatus as claimed in claim 1, wherein the braking means comprise at least one loop of canvas or like woven material arranged to be lowered to engage the upper surface or the length of material and to press it down on to the horizontal surface or on to the upper surface of the previously deposited length of material.

7. Apparatus as claimed in any of the preceding claims, wherein a common drive is provided for the gripping members, the cutting blades and the braking means to ensure that the different operations take place in the correct time sequence.

8. Apparatus as claimed in claim 1, wherein the stacking surface on to which the lengths of material are deposited is horizontal and consists of a tray having twice the width of the material and slidable transversely of the apparatus whereby when sufficient lengths of material have been deposited at one side of the tray, the tray is moved across the apparatus so that the next length of material is deposited at the other side of the tray and the stacked lengths can be removed.

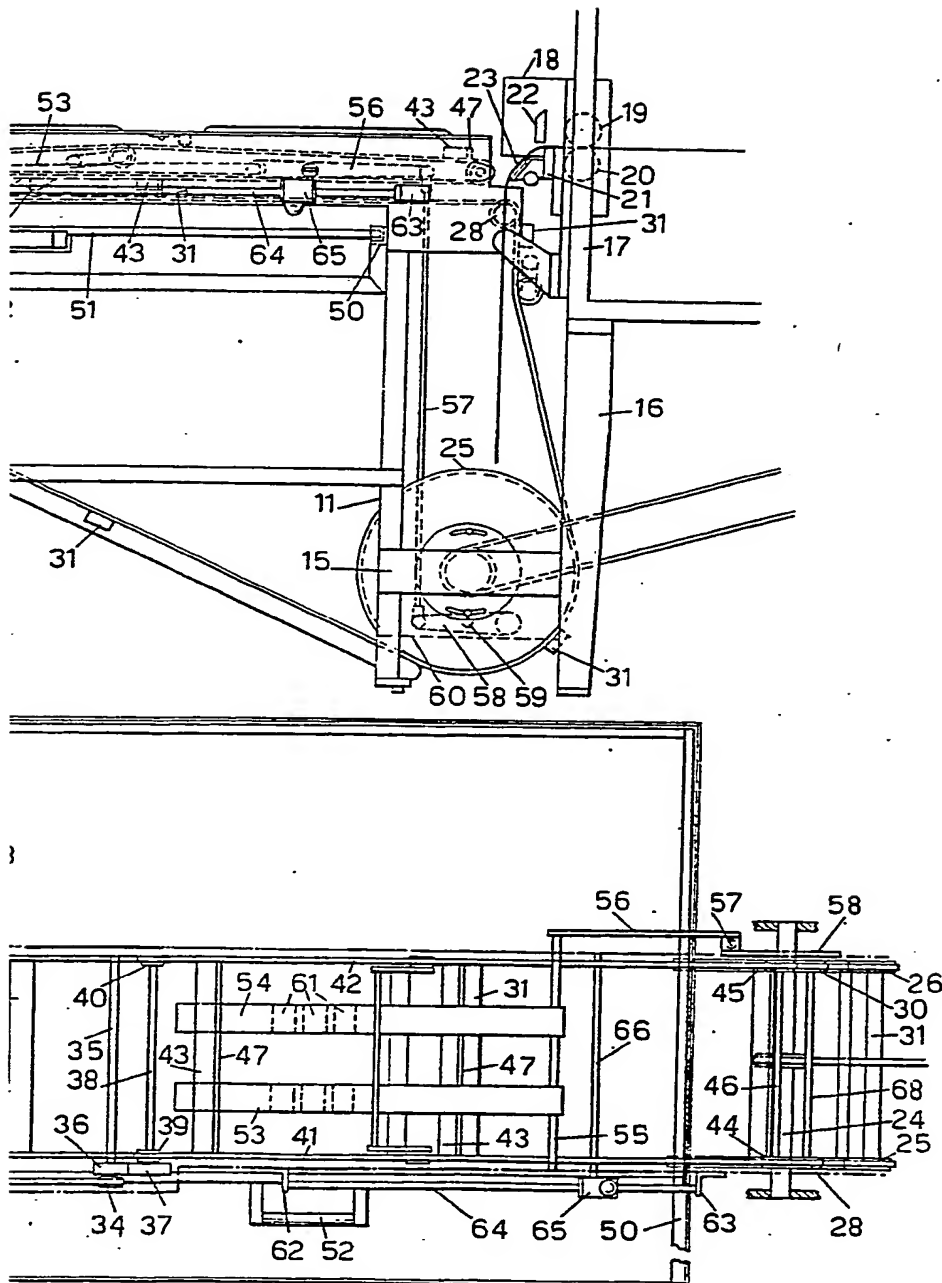
9. Apparatus for stacking tubular lengths of tubular plastics material substantially as described with reference to the accompanying drawings.

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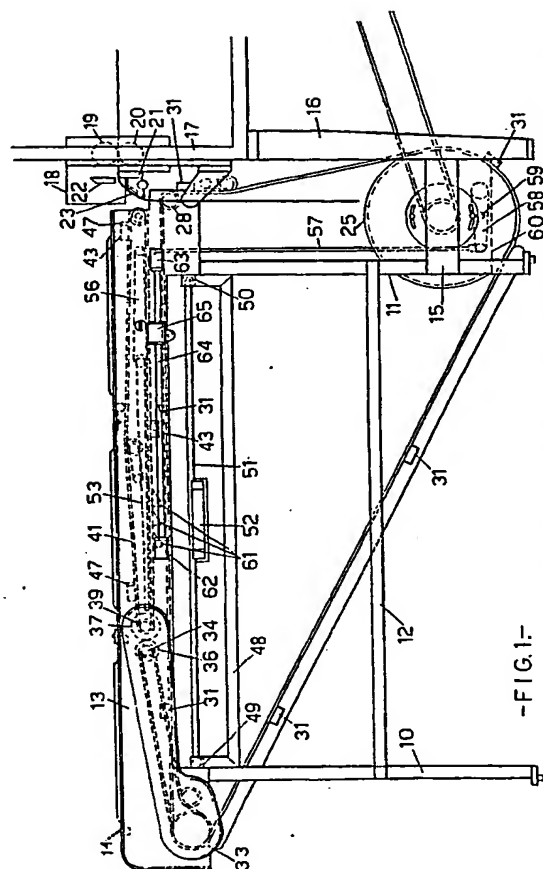


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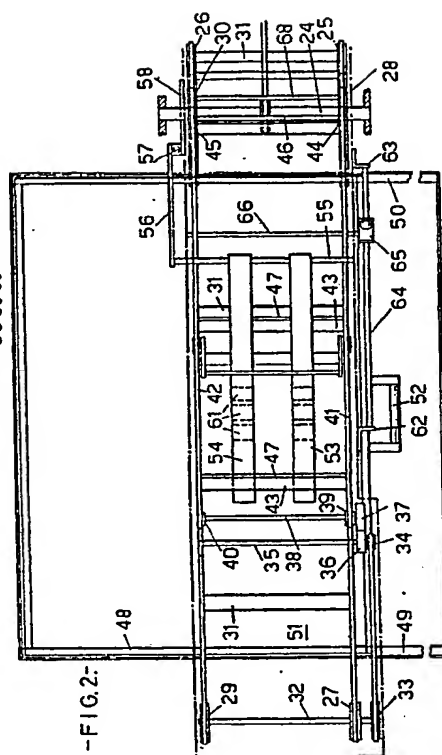
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 Sheet 1



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-FIG. 1:-



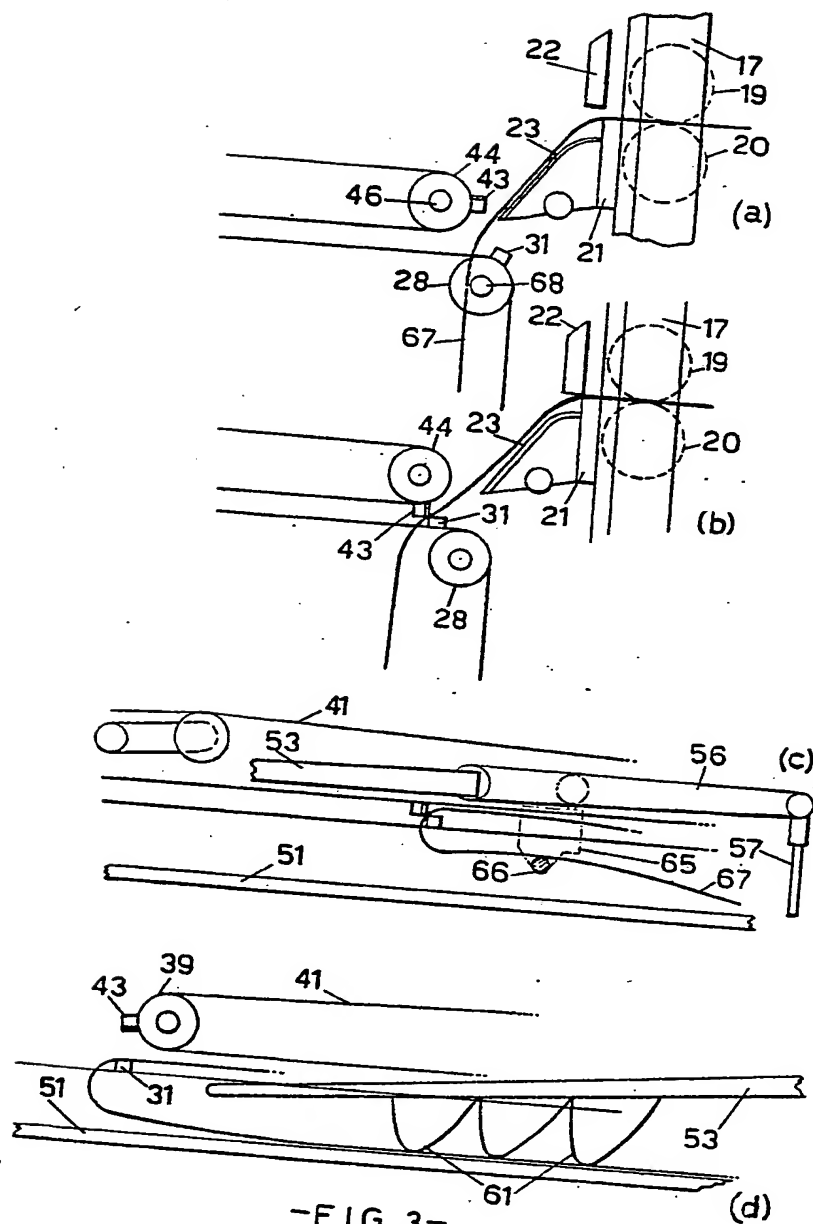
-FIG. 2:-

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